

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE SYSTEMATIC POSITION OF THE BATS *DESMODUS*
AND *CHILONYCTERIS*, BASED ON HOST-PARASITE
RELATIONSHIPS (MAMMALIA; CHIROPTERA)¹

BY C. E. MACHADO-ALLISON
*Instituto de Zoología Tropical, Universidad
Central de Venezuela*

Patterson (1956) has pointed out that the fossils and ectoparasites of bats provide very little evidence which can be used in clarifying the problems of phylogeny in the order Chiroptera. Indeed, chiropteran fossils are scarce, and the majority of chiropteran ectoparasites belong to groups that, having a life history stage off the body of the host, do not show notable specificity. Another factor detracting from the use of ectoparasites is the intimate ecological association existing between bats of different groups, particularly those found in caves, holes in trees, etc., where, occasionally, several species roost together. This behavior favors, without doubt, polyhaematophagy, and there are striking cases of this such as the presence of fleas of the family Ischnopsyllidae on bats of the distantly related families Molossidae (*Tadarida Rafinesque*) and Noctilionidae (*Noctilio* Linnaeus). However, host-parasite relationships may yet prove to be of value in shedding new light on phylogenetic problems in Chiroptera. It must be realized that we still know little about such relationships in the majority of bats and that only in the last few years have careful, well-documented collections of the ectoparasites been made.

In view of these facts, it becomes particularly important to study a group of ectoparasites, such as the Spinturnicidae (Acarina, Mesostigmata) which apparently show great host

¹A contribution of the Smithsonian Venezuelan Project, supported by a contract (DA-49-193-MD-2788) of the Medical Research and Development Command, Office of the Surgeon General, U. S. Army.

specificity (Rudnick, 1960; Machado-Allison, 1965a), and also show peculiar modifications in their life cycle (Baer, 1952; Rudnick, *op. cit.*), for instance, ovoviviparity and reduction in number of nymphal stages.

In the past few years I have been studying the taxonomy of the Neotropical Spinturnicidae, especially of the genus *Periglischrus* Kolenati (Machado-Allison, 1965b), which is intimately related to the bats of the family Phyllostomidae. Comparing the arrangement of the genera and subfamilies of Phyllostomidae, based on the work of Miller (1907) and Simpson (1945), now accepted by most mammalogists, with certain data offered by the relationships of Spinturnicidae and the bats, I find some significant disagreements which I want to point out.

According to Simpson (*op. cit.*), the superfamily Phyllostomoidea includes the families Phyllostomidae and Desmodidae. Simpson divided the family Phyllostomidae into seven subfamilies: Chilonycterinae, Phyllostominae, Glosophaginae, Carollinae, Sturnirinae, Stenodermatinae, and Phyllonycterinae. Among these subfamilies, only one, Phyllonycterinae, is not known to be parasitized by the Spinturnicidae (there are no published data on the Carollinae, but I have recently found a new spinturnicid on *Rhinophylla pumilio* Peters).

The Chilonycterinae occupy a special position in the Phyllostomidae. The absence of a noseleaf and the lack of articulation of the trochiter with the scapula clearly differentiate these bats from those of the other subfamilies. These features led Winge (1923) to associate the Chilonycterinae with the Noctilionidae in a section of the Phyllostomidae that he called "Mormopini." Novick (1963) found the orientation sounds and associated anatomical features of the Chilonycterinae to differ sharply from those of other phyllostomids.

Spinturnicidae have not been found on the Noctilionidae, and the only South American form that I have found on *Chilonycteris* Gray presents morphological characteristics so peculiar that I have considered it to belong to a genus *Cameronieta* Machado-Allison, distinct from *Periglischrus* (Machado-Allison, 1965a). The other subfamilies of Phyllostomidae are

TABLE 1. Host-parasite relationships of Phyllostomidae with Spinturnicidae.

Spinturnicid species	Chiropteran genera	Present subfamilial assignment
<i>Cameronieta thomasi</i>	<i>Chilonycteris</i>	Chilonycterinae
<i>Periglischrus acutisternus</i>	<i>Phyllostomus</i>	Phyllostominae
<i>Periglischrus torrealbai</i>	<i>Phyllostomus</i>	
<i>Periglischrus parvus</i>	<i>Micronycteris</i>	
<i>Periglischrus setosus</i>	<i>Glossophaga</i>	Glossophaginae
<i>Periglischrus squamosus</i>	<i>Anoura</i>	
<i>Periglischrus hopkinsi</i>	<i>Lionycteris</i>	
<i>Periglischrus ojustii</i>	<i>Sturnira</i>	Sturnirinae
<i>Periglischrus iheringi</i>	<i>Artibeus</i> , <i>Vampyrops</i> , etc.	Stenodermatinae
<i>Periglischrus</i> sp.	<i>Rhinophylla</i>	Carolliinae
<i>Periglischrus herrerae</i>	<i>Desmodus</i>	Desmodidae

parasited by species of *Periglischrus* (three species on Glossophaginae, three on Phyllostominae, one on Carolliinae, one on Sturnirinae, and one on Stenodermatinae; see Table 1).

Desmodus rotundus E. Geoffroy, family Desmodidae, is the host of the species *Periglischrus herrerae* Machado-Allison, which clearly belongs to the genus *Periglischrus*. In orientation behavior *Desmodus* resembles phyllostomid genera (Novick, *op. cit.*).

The evidence presented here indicates that a reappraisal of the familial relationships of the Chilonycterinae and the Desmodidae is in order. I would suggest that rather than being a subfamily of the Phyllostomidae, the chilonycterines may form a distinct family. The desmodids, on the other hand, may be no more than a subfamily of the Phyllostomidae.

LITERATURE CITED

- BAER, J. 1952. Ecology of Animal Parasites. The University of Illinois Press, Urbana, 223 pp.
- MACHADO-ALLISON, C. E. 1965a. Notas Sobre Mesostigmata Neotropicales III. *Cameronieta Thomasi*: Nuevo Genero y Nueva Especie Parasita de Chiroptera (Acarina, Spinturnicidae). Acta Biol. Ven., 4(10): 243-258, 15 Figs.

- . 1965b. Las Especies Venezolanas del Genero *Periglischrus* Kolenati, 1857, (Acarina, Mesostigmata, Spinturnicidae). *Acta Biol. Ven.*, 4(11): 259-348, 46 Figs.
- MILLER, C. S. 1907. The Families and Genera of Bats. Smithsonian Inst., U. S. Nat. Mus., Bull. no. 57, 282 pp., 14 pls.
- NOVICK, A. 1963. Orientation in Neotropical bats. II Phyllostomatidae and Desmodontidae. *Journ. Mamm.*, 44: 44-56.
- PATTERSON, B. 1956. Mammalian Phylogeny. Ier. Symp. Specif. Parasit., Neufchatel, pp. 15-49.
- RUDNICK, A. 1960. A Revision of the Mites of the Family Spinturnicidae (Acarina). *Univ. Calif. Publ. Entomol.*, 17(2): 157-284, pls. 18-48.
- SIMPSON, G. G. 1945. The principles of classification and a classification of mammals. *Bull. Amer. Mus. Nat. Hist.*, vol. 85, 350 pp.
- WINGE, H. 1923. *Pattedyr-Slaegter*. Kjobenhavn, H. Hagerups F. vol. 1, 360 pp.